National Aeronautics and Space Administration

Lyndon B. Johnson Space Center
Houston, Texas

Suit sizing

New sizing rings on the Extravehicular Mobility Unit bring space suits into space station era. Story on Page 3.

Teacher workshop

JSC friends, family spend a week in hands-on space activities. Story on Page 4.

Space News Roundup

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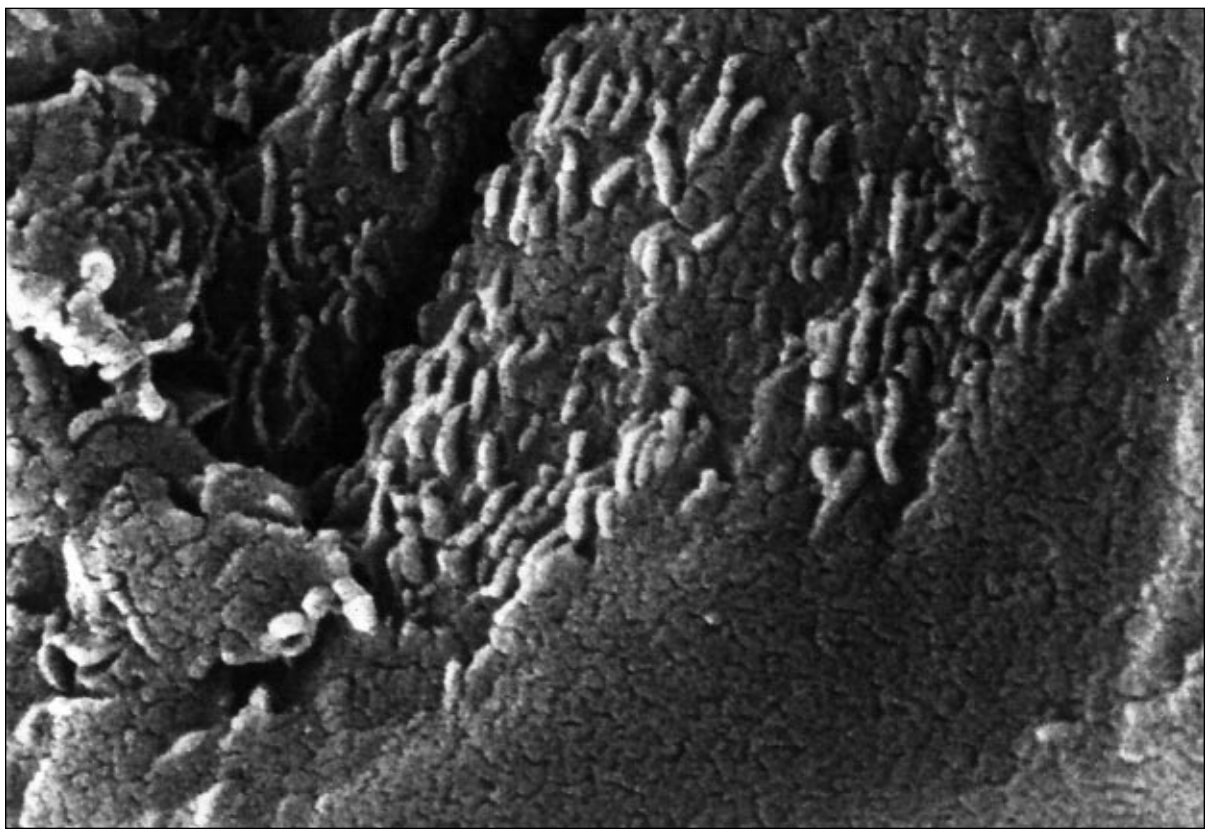
Atlantis to return to VAB for mating next week

Work continued at the Kennedy Space Center this week to prepare *Atlantis* for its mating to a pair of new solid rocket boosters and a new external fuel tank for blastoff around Sept.12 on STS-79, the fourth docking mission with the Russian Mir Space Station.

Atlantis was returned to the Orbiter Processing Facility from the Vehicle Assembly Bldg. at KSC earlier this week to await final leak checks on the new set of boosters which was successfully completed. The shuttle will be rolled back to the VAB early next week to mate it with its new solid rocket boosters and external tank. *Atlantis* is scheduled to return to Launch Pad 39A on Aug. 20 for final preparations before its six astronauts, Commander Bill Readdy, Pilot Terry Wilcutt and Mission Specialists Jay Apt, Tom Akers, Carl Walz and John Blaha, fly to KSC for a dress rehearsal of their countdown August 27 and 28.

Blaha will replace U.S. Astronaut Shannon Lucid aboard the Mir once *Atlantis* has docked to the space station to begin a four and a half month tour of duty on the Russian complex. Lucid is completing her 20th week aboard Mir, conducting a variety of life sciences and materials experiments. A new Mir crew, Commander Gennady Manakov, Flight Engineer Pavel Vinogradov and French Cosmonaut Researcher Claudie Andre-Deschays, will be launched in a Soyuz capsule on Aug. 17 to replace Lucid's crewmates, Mir 21 Commander Yuri Onufrienko and Flight Engineer Yuri Usachev. Onufrienko and Usachev will return to Earth with Deschays following a two-week handover in joining Lucid on orbit. Lucid is scheduled to return to Earth with the STS-79 crew in the third week in September. A firm launch date for STS-79 is expected to be set Aug. 29.

Meanwhile, *Columbia* is undergoing routine processing for its launch around Oct. 31 on STS-80, a 16-day flight to deploy and retrieve both the ORFEUS-SPAS astronomy satellite and the Wake Shield Facility, in which thin film semiconductor material will be grown. Commander Ken Cockrell heads a five-person crew on the flight, which also will feature a pair of space walks to test assembly tech-



JSC Photos

Above: This electron microscope image is a close-up of the Mars meteorite. While the exact nature of these tube-like structures is not known, one interpretation is that they may be microscopic fossils of primitive, bacteria-like organisms that may have lived on Mars more than 3.6 million years ago. Right: This image shows an unusual tube-like structural form that is less than 1/100th the width of a human hair in size found in the meteorite.

Mars meteorite yields evidence of primitive life

By James Hartsfield

A research team of scientists at JSC and Stanford University has found evidence that strongly suggests primitive life may have existed on Mars more than 3.6 billion years ago.

The NASA-funded team found the first organic molecules thought to be of Martian origin—several mineral features characteristic of biological activity—and possible microscopic fossils of primitive, bacteria-like organisms inside an ancient Martian rock that fell to Earth as a meteorite. This array of indirect evidence of past life will be reported in the Aug. 16 issue of the journal *Science*, presenting the investigation to the scientific community at large to reach a future consensus that will either confirm or deny the team's conclusion.

The two-year investigation was co-led by planetary scientists David McKay, Everett Gibson and Kathie Thomas-Keprta of Lockheed-Martin, all from JSC, with the major collaboration of a Stanford team headed by Professor of Chemistry Richard Zare, as well as six other NASA and university research partners.

"There is not any one finding that leads us to believe that this is evidence of past life on Mars. Rather, it is a combination of many things that we have found," McKay said. "They include Stanford's detection of an apparently unique pattern of organic molecules, carbon compounds that are the basis of life. We also found several unusual mineral phases that are known products of primitive microscopic organisms on Earth. Structures that could be microscopic fossils seem to support all of this. The relationship of all of these things in terms of location—within a few hundred thousandths of an inch of one another—is the most compelling evidence."

"It is very difficult to prove life existed 3.6 billion years ago on Earth, let alone on Mars," Zare said. "The existing standard of proof, which we think we have met, includes having an accurately dated sample that contains native microfossils, mineralogical features characteristic of life and evidence of complex organic chemistry."

"For two years, we have applied state-of-the-art technology to perform these analyses, and we believe we have found quite reasonable evidence of past life on Mars," Gibson added. "We don't claim that we have conclusively proven it. We are putting this evidence out to the scientific community for other investigators to verify, enhance, attack—disprove if they can—as part of the scientific process. Then, within a year or two, we hope to resolve the question one way or the other."

"What we have found to be the most reasonable interpretation is of such radical nature that it will only be accepted or rejected after other groups either confirm our findings or overturn them," McKay added.

The igneous rock in the

Please see **MARS**, Page 4

Mir crew shares Olympic highlights

By Natasha Calder

Astronaut Shannon Lucid and her Mir 21 crewmates—Commander Yuri Onufrienko and Flight Engineer Yuri Usachev—spent this week sorting supplies, sharing Olympic highlights and conducting research.

Progress—the unmanned Russian supply capsule—was launched last Wednesday reaching the Russian Mir Space Station last Friday. The supply capsule delivered two tons of food, fuel and other items to the crew, including the care package of books and junk food requested by Lucid for her extra six week stay on Mir. Progress also carried with it experiment hardware for the upcoming Mir 22 mission.

The crew spent Saturday viewing a package of highlights from the Olympic games, which included the opening ceremonies and several events in which both the Russians and the Americans won Olympic gold medals. During an interview last Thursday, the crew expressed their appreciation for the opportunity to view the games and congratulated all the Olympic athletes.

"We wish them the achievement of success that they have place before them in their trip to Atlanta and success in the future," Onufrienko said.

"We want to wish all of the athletes there at the Olympic games the best success and I hope that every single one of them returns home feeling that they have done their very best and that they are very satisfied with the effort they put forth," Lucid added.

This week, the Mir 21 crew finished up many of its planned experiments and began setting up the experiments for the next Mir crew which is now set to launch about 8:18 a.m. Aug. 17 from Kazhkstan, Russia.

American Astronaut John Blaha, who will join the Mir 22 crew when *Atlantis* docks with the Russian outpost during STS-79, will leave this weekend to watch the launch of his crewmates, Commander Gennady Manakov, Flight Engineer Pavel Vinogradov and French Cosmonaut Researcher Claudie Andre-Deschays.

JSC inventors to be honored

Thirty five center employees will be honored at noon Wednesday at the annual JSC Inventors Luncheon to be held at the Gilruth Center.

JSC Associate Director John Young, along with JSC's Patent Counsel Ed Fein, will present awards to employees whose NASA patents were issued in 1995.

Honorees include: Former JSC employee Frederic Dawn, Walter Guy and Joseph Kosmo of Engineering for the Method for Forming a Glove Attachment; Scott Swan of

Please see **LUNCHEON**, Page 4

A T-shirt with the new JSC, St. Luke's cooperative logo will be available to donors at the August blood drive.

JSC host blood drive soon

JSC will host a blood drive from 7:30 a.m.-3:30 p.m. Aug. 15 in Teague Auditorium.

"Employees face a substantial challenge if they want to surpass the level of generosity they exhibited at the May 23 blood drive, said Dan Mangieri, one of the coordinators for the drive. "The center broke all previous records for blood donations, with 300 employees taking time out to give blood."

Mangieri said donors can give blood every eight weeks, with the whole process taking approximately 30 minutes under normal circumstances. The huge turnout at the last blood drive caused some unusually long lines, but St. Luke's promises to be prepared with more personnel to handle the crowds. Employees are encouraged to "bring a buddy."

There are many benefits to being a blood donor, Mangieri said. Under the St. Luke's agreement with JSC and contractors, the hospital provides blood assurance coverage for all JSC personnel and their immediate families. Many employees have benefited directly from the program. Coverage includes all fees associated with blood products for blood transfused in any Houston area hospital.

As another bonus to donors, St. Luke's will send donors a card with information about their blood group, type and cholesterol level approximately three to four weeks after each donation. Donors also are notified of any positive results found during the regular series of tests performed on donated blood, including the tests for hepatitis and HIV. All tests results are kept confidential. For details call Marty Demaret at x36007 or Dan Mangieri at x33003.